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Technical News Bulletin No. 62.

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GENERAL NOTE

Owing to the current nature of the investigations mentioned in the Technical News Bulletin, sometimes it will be impossible to supply printed information regarding them. However, in these cases, when the investigation has progressed sufficiently far, the Bureau will be pleased to furnish technical data to those engaged in the particular application of the subject, in order to avoid the delay incident to publication.

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1 Ammonia Table

A knowledge of the thermodynamic properties of ammonia is of the greatest importance in the refrigerating industry. What steam tables are to the mechanical engineer, ammonia tables are to his colleague in the refrigerating industry. Nevertheless, in spite of their importance, heretofore such tables have been based on meager and inaccurate information.

Measurements of the specific heat of superheated ammonia vapor complete the measurements which the Bureau has been making for the purpose of establishing a table of thermodynamic properties of ammonia. The entire series of separate but correlated researches relating to the behavior of ammonia as a refrigerating agent has extended over a period of 8 years. The work is the outgrowth of the appeal of the American Society of Refrigerating Engineers that the Bureau recommend an ammonia table for official adoption in place of the several more or less discordant tables then in use. The inadequacy of actual physical data and the element of choice in its selection and incorporation into the existing tables, together with the difficulty of making a judicious selection among these, made it inexpedient for the Bureau to choose any existing one, and as an alternative, measurements of the thermodynamic properties of ammonia were undertaken.

In this work the Bureau has had the valuable cooperation of the American Society of Refrigerating Engineers. As in the case of each of the preceding investigations of the series, the one just concluded has required the development of experimental methods, as well as the design and construction of special apparatus in preparation for the experimental work. The flow calorimeter used in the present work, together with the accessory equipment incidental to its use, required two years to perfect. Many refinements have been incorporated to adapt the apparatus to the wide range of temperature and pressure to be covered without sacrificing such valuable features as sturdiness, responsivity, reliability, and accuracy. The determination of the value of the superheat of ammonia which has resulted from these measurements is not the most important part of the heat exchange in a refrigerating process, but a uniform accuracy of the table in all its parts is an advantage, and these measurements have maintained that accuracy. The working range covered extends from -40°C (-40°F) to +150°C (+302°F) and up to a pressure of 20 atmospheres.

The results of the entire series of measurements are embodied graphically in a Mollier chart which was presented at the Detroit meeting of the American Society of Refrigerating Engineers. This chart is doubtless the only similar chart of thermodynamic properties of a working fluid for a heat engine which is based entirely upon actual measurements made in one laboratory, upon a fluid of a definite quality, in a program of separate investigations, each complete, each planned and executed according to a high standard of accuracy, and all extending over the entire range of conditions to be covered by the table. The resulting data have been made thermodynamically consistent, not by mutual adjustment of values or by arbitrary choice, as in the previous tables, but by perfection of experimental technique to the point where outstanding discrepancies are negligible. In this respect. the chart is unique in its class. It is now published merely as a preliminary edition, subject to revision. The completion of this work makes ammonia better known as to its thermodynamic behavior within its working range than any other fluid.

2 Sensitometry of Photographic Emulsions and a Survey of the Characteristics of Plates and Films of American Manufacture

This subject is treated in Scientific Paper No. 439 of the Bureau of Standards which may be bought from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 35¢ a copy.

The paper is the result of a survey of about 90 different brands of photographic plates. In this survey, the speed, developing characteristics, color sensitiveness, filter factors, and scale of the plates were investigated. The introductory part deals in a general way with the preparation and classification of the emulsions, photographic filters, the relation between exposure of the photographic

plate and the resulting density, the effect of time of development on contrast, speed, and inertia, scale and latitude, other methods of measuring plate speeds, effect of the presence of bromide in emulsions, and the general methods of development in use.

The second part is devoted to the apparatus and methods employed in the investigation. A light source having the composition of average noon sunlight at Washington was used, while the sensitometer was a special design of the sector-disc type exposing each of 9 successive areas of a given plate for double the time of the preceding area. Two methods were employed for investigating the color sensitivity, that of photographing the spectrum to reveal the region of sensitiveness, and that of measuring the filter factors to determine how one plate compared with another when different filters were used. For obtaining the spectrograms, use was made of a transmission diffraction grating giving a normal spectrum, while the filter factor apparatus was designed to reduce the intensity of the undimmed white light on the plate by a measurable amount until it gave for the same exposure time the same darkening effect as the light which passed through the filter.

The third part of the paper gives data obtained from practically all brands of emulsions made in the United States, the trade names of the emulsions being omitted.

3 Interference Methods for Standardizing and Testing Precision Gage Blocks

Precision gages, which are blocks of metal (usually steel) having 2 opposite faces plane, parallel, and a specified distance apart, are used in the shops as reference end standards for checking micrometers and other measuring instruments and also as distance pieces or size blocks for precise mechanical work. The extensive use of precision gages necessitated by the small tolerances allowed in the manufacture of interchangeable machine parts has required more accurately determined end standards and more rapid and precise methods for comparing gages with these standards than have previously been available. Since comparisons of end standards with line standards by means of micrometer-microscopes and of precision gages with end standards by means of contact instruments are subject to appreciable errors, methods which make use of the interference of light waves have been used by the Bureau of Standards in making these measurements.

Scientific Paper No. 436 of the Bureau of Standards has been prepared and describes interference methods by which the planeness and parallelism errors of precision surfaces can be measured, and the length of standard gages can be determined by direct comparison with the standard light waves with an uncertainty of not more than a few millionths of an inch. The errors of other gages can be

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determined by comparison with these calibrated standards with equal precision. The process makes the standard light waves, which have been determined to 1 part in 4 or 5 million relative to the international meter, the standards of length for this work. The apparatus used for calibrating standards and comparing other gages with these standards is illustrated by line drawings and thoroughly explained. The paper may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10¢ per copy.

4 Magnetic Determination of Iron as an Impurity in Brass

The presence of iron in brass is sometimes objectionable as it exerts a bad influence on the mechanical properties or interferes with cutting. For this reason, a rapid non-destructive method for its determination would be of value. In order to investigate the possibilities of a magnetic test in this connection, the Bureau has made a study of the magnetic properties of a series of samples of cast brass containing varying amounts of iron up to 1%. It was found that the physical condition of the material as affected by heat treatment exerted a great influence on its magnetic properties, and that a quantitative determination, at least for the type of material investigated, is not feasible. There is no direct relationship between the magnetic properties and the carbon content.

5 Some Observations on the Nick-Bend Test for Wrought Iron

A paper on this subject has been approved by the Bureau for publication in the Journal of the American Society for Testing Materials. The following abstract is the scope of the investigation and the results:

The "nick-bend" test is included in nearly all specifications for wrought iron. The usual statement says that the fracture of the nicked bar shall show no crystalline areas, or at least not more than a specified per cent. The clause, as usually given in American specifications, allows the nicked bar to be broken either by pressure or by blows. Foreign specifications of this test differ widely from American practice and from each other.

The investigation consisted in the fracturing, under known conditions, of nicked bars of 9 grades of wrought iron furnished by 5 different manufacturers. The composition, structure, and mechanical properties of the materials were determined, and the method of fracturing varied from simple transverse bending to severe impact, these extremes being permitted by current specifications.

The results indicate that the rate of application of the stress is one of the most important of the factors determining the character of the fracture. All of the 9 bars successfully "passed" the nick-bend test when subjected to impact. The character of the notch is of vital importance also.

Two distinct types of crystalline areas may be, and usually are, produced in the nick-bend test, one near the tension side of the bar, as stressed, the other on the compression side. Crystalline areas of this second type depend for their crystalline appearance upon the preliminary compression and flattening which the crystals on this side have to undergo and do not necessarily indicate any characteristic features of the unstressed material.

Crystallinity in the fracture is not necessarily indicative of steel in the iron, although prominent steel streaks do have an influence. The size and distribution of the slag streaks, together with the relation which the notch bears to them, also affect the fracture.

6 Effect of Rate of Heating in Hardening Steels

The rate of heating for hardening has rarely been accurately regulated, though it is apparently of considerable importance, at least in some steels and under certain conditions where control in dimensional changes in quenching is desired. This question is, therefore, of vital importance to manufacturers of die castings and in the production of thread gages. A series of 16 samples of chrome-vanadium die steel was hardened, using various rates of heating, and these dimensional changes noted. Unfortunately, the desired uniformity of results was not always obtained, but in view of the discrepancies found in other types of tests on the same steel, it is believed that the metal did not have the required uniformity. Similar tests of different steels will be carried out during the month and upon their completion further comments concerning these changes will be made.

7 Molding Sand

In cooperation with the joint committee of the National Research Council and the American Foundrymens' Association, the Bureau is investigating standard methods of testing molding sands. Several meetings of the test committee on sands have been recently held and a great deal of the laboratory work on which the test specifications will be based is being carried out at the Bureau. The formulation of the fineness test is practically complete, and the cohesiveness and other physical tests are well under way.

8 Steel Car Wheels

Thermal stress tests of 3 special wheels have been completed, and a tensile test specimen has been machined from one of the wheels and the results computed. A thermal expansivity specimen has been machined from the same wheel, and the necessary computation in connection with the expansivity determination is now under way. Thermal stresses developed in the plates of these 3 wheels, 2 of which are of a "freak" design, one being a thin plate and one a straight plate wheel, have been computed using thermal expansion coefficients obtained upon steels of

similar composition. The thermal stresses developed in the wheel of standard design were of the same kind as those obtained in wheels of similar design but from other manufacturers. The stresses developed in the thin plate were of greater magnitude but of similar nature, while those in the straight plate were in tension on both sides of the plate. The location of the maximum stresses along the radius was not the same on the back of the wheel as on the front.

Progress has been made in the compilation of a report covering all the thermal stress tests of steel wheels, and a study is being made of the residual strains left in rolled steel wheels due to the method of manufacture.

9 The Reclaiming of Lubricating Oils

The Bureau of Standards is carrying out an investigation of the possibilities of increasing the quantity of used lubricating oil which may be reclaimed. Experiments with a commercial type of oil reclaimer, which involved increasing the temperature at which the oil was allowed to stand from 180 to 200°F, increased the amount of oil recovered from 80 to 89%. The data obtained show that the reclaimed oil is similar to new oil except with regard to sediment. Satisfactory means for the removal of this sediment, which is probably carbon, requires further investigation. In this connection, it should be borne in mind that this increase in oil recovered may represent an increase in quantity at the expense of quality.

10 Physical Tests of Hog Bones

At the request of the Department of Agriculture, the Bureau of Standards recently conducted a rather unusual test to determine the strength of the leg bones of hogs. The above-named department in sending a shipment of hogs from an experimental farm in Louisiana to Washington discovered that many of the leg bones were broken in transit. Comparative tests were made at the Bureau of Standards between bones of the Louisiana hogs and those of hogs raised at the Beltsville experimental farm near Washington. The results indicated that the bones of the former animals were considerably weaker than those of the latter.

11 The Electromotive Force of Cells at Low Temperatures

Scientific Paper No. 434 of the Bureau of Standards, for sale by the Superintendent of Documents, Government Printing Office, this city, at 5¢ per copy, deals with the electromotive force of dry and storage batteries at low temperatures. The practical importance of a knowledge of the electromotive behavior of these two types of batteries at low temperatures has arisen from their use in the arctics and at high altitudes. Measurements were made on dry cells and storage batteries cooled to -72°C (-98°F) by

carbon dioxide snow and to -170°C (-274°F) by liquid air. The Gibbs-Helmholtz equation was applied to the observations, and excellent agreement between theory and observation was found. At the lowest temperatures, high values of voltage were sometimes observed, and the polarity was often reversed. A possible explanation based on the Nernst equation is given.

12 International Union of Scientific Radio Telegraphy

The International Union of Scientific Radio Telegraphy was organized 2 years ago for the purpose of furthering, through internation cooperation, the systematic study of fundamental problems of radio communication. Separate sections have been formed for a number of different countries, and the work of the American section has been in progress for over a year. Recently systematic measurements have been made at receiving stations in the United States of the intensity of signals received from several French stations and by a continuance of these measurements it is expected that more comprehensive knowledge will be obtained of the phenomena of radio transmission.

A meeting of the American section was held very recently at which the various committees reported, including committees on the study of radio wave intensity, atmospheric disturbances, variations of radio wave direction, measurements of radiations which cause interference, and electron tubes. Particularly in the case of the measurements of the intensity of radio waves, it is important that international cooperation be promoted, since it is only by frequent simultaneous measurements made cooperatively by widely separated sending and receiving stations that accurate results may be obtained.

13 New Radio Publications

Members of the staff of the Bureau of Standards have recently published in the May, 1922, issue of the "Journal of the Optical Society of America" and "Review of Scientific Instruments" three papers describing certain apparatus used in investigations in the radio laboratory. The first paper by R. T. Cox, entitled "Standard Radio Wavemeter Type R70B," describes a standard wavemeter constructed at the Bureau and used in the standardization of radio apparatus. A description of this wavemeter will be found in Bulletin No. 54.

A paper by H. A. Snow, entitled "An Electron Tube Amplifier for Amplifying Direct Current" describes an instrument which has been developed at the Bureau for particular applications in electric signalling work. This amplifier can be used in place of a polarized relay and also for various other purposes, including the recording of telegraphic and radio signals.

E. L. Hall and J. L. Preston, in a paper entitled "High Voltage Storage Battery for use with Electron Tube Generators of Radio Frequency Currents" describe a special

type of storage battery developed at the Bureau employing a considerable number of small storage cells contained in glass jars only about 1-1/2" square and 4" high. These cells are assembled very compactly in trays. Storage batteries of this type can supply small currents at 100 volts which meets the requirements of some kinds of electron tube sets.

14 Conference on Radio Direction Finder for Marine Use

On Friday, May 12, 1922, 9 companies interested in the manufacture of radio direction finders met at the Bureau of Standards to confer with the Assistant Secretary of Commerce, the Bureau of Lighthouses, and the Bureau of Standards, regarding the production, cost, installation, calibration, and maintenance of radio direction finders on shipboard.

It was announced that the Department of Commerce has decided to install the following radio beacon stations: Boston, Nantucket, Cape Charles, Columbia River, Puget Sound, and, if funds are still available, Delaware Bay, Los Angeles, and Blunts Reef. These are in addition to the 2 new radio beacons at Diamond Shoal (off Cape Hatteras) and San Francisco Light Vessel. Three other radio beacons have been in operation in the vicinity of New York Harbor for over a year at Ambrose, Fire Island, and Sea Girt.

Besides the requests for more radio beacons, which are now being received from foreign companies whose boats are equipped with radio direction finders, American shipowners are also asking for better service, as they realize the growing importance of radio direction finders on their vessels.

As a result of the conference, arrangements will be made through the Bureau of Lighthouses, between the manufacturers of radio direction finders and the operators of steamships for the trial and demonstration of radio direction finding equipment produced by the several manufacturers under conditions of practice.

15 Wood Screw Conference

On May 12, a conference for the purpose of standardizing wood screws was called by the Department of Commerce and held at the Bureau of Standards. Eight of the largest wood screw manufacturers in the United States were represented. A standard method of measuring lengths together with a standard list of numbers, diameters, tolerance in diameters, pitches, tolerance in pitch, lengths, tolerance in length, and the proportional length to be threaded were adopted. Flat, round, and oval heads were designated as standards.

The method of measuring length which was adopted may be stated as follows: The length of all kinds of screws shall be measured from the largest diameter of the bearing surface of the head to the extreme end (measured parallel to the axis).

16 Specifications for China Tableware

A conference was held with the Research Committee of the U. S. Potters' Association at the Bureau of Standards on April 25 to consider specifications for hotel ware. Tentative specifications which had been prepared were discussed and many items decided upon as satisfactory. Additional testing was planned, and the cooperation of the members of the Potters Committee in 3 cooperative researches is now assured.

At the completion of the work outlined, another conference will be held at which the preparation of specifications will be completed.

17 Specifications for Plate and Sheet Glass

A conference of the full committee on specifications for plate and sheet glass was held at the Bureau on May 8. The work accomplished was a complete revision of the tentative specifications for window glass with an agreement to accept these at the next meeting with such minor corrections as might seem necessary. A report of this meeting has been sent to all those interested, and a complete tentative set of specifications of all sheet glasses, as revised, is now being prepared for mailing. This will probably go out with a call for a new meeting early in June, at which time specifications for plate glass will be discussed.

18 Standardization of Shade Cloth

A conference on standardization of shade cloth was held at the Bureau on April 21. The various government departments interested in this material and the committee appointed by the manufacturers were present. It was brought out that standardization in this field is quite possible and would bring about mutual savings to the manufacturers and consumers.

It was decided that a committee of manufacturers should submit to the Bureau a specification which in their opinion would give a satisfactory shade cloth for government use. A representative of the manufacturers attended a meeting on the standardization of window glass on May 8 to assist those present in forming an idea as to the relation of shade cloth to window glass in connection with the standardization of the latter. The date of the next meeting will be set when the manufacturers have collected sufficient data to draw up the proposed specification.

19 Standardization of Cordage

Three committees, one on service tests, another on laboratory tests, and the third on nomenclature, are at work upon the standardization of cordage, and some of their efforts in this direction have previously been mentioned in the Bulletin.

A meeting of the service test committee was held at the Bureau of Standards on April 18. At this meeting a very comprehensive report was made up for the benefit of the laboratory test committee to assist them in solving the

question of the requirements of a rope under the conditions found in actual service. Lt. Leroy Reinburg was elected chairman of the committee which will proceed to collect data on past endurance tests and on future tests which may be helpful to the laboratory test committee. The last-named committee held a meeting on May 19. A general discussion of the report of the service committee took place, and a tentative outline of tests to be made in the laboratory was formulated. Mr. F. R. McGowan of the Bureau of Standards was elected chairman.

The committee on nomenclature met on April 26. The work was divided in 3 main classes, the definition of terms; first, from a practical point of view, second, with relation to the fiber, and, third, from a manufacturing point of view. Lt. Reinburg is to obtain an interpretation of the words employed in seafaring organizations, the Department of Agriculture of the words dealing with fiber, and the manufacturers of words peculiar to their interests. Actual definitions were compiled covering such terms as cordage, fiber, sliver, twist, lay, turns, etc. The words obtained were classified and assigned to various members of the committee.

Mr. J. S. McDaniel, secretary of the Cordage Institute expressed a desire to have a meeting in New York of all 3 committees, and the members agreed that their next meeting would be held in that city.

20 Meeting of the Textile Research Committee

In line with the purpose of the Department of Commerce to make the textile section of the Bureau more available and of better service to the textile industry, a conference was called on May 20 of representatives of the various branches of the textile trade. The best means for bringing about the desired results and the formulation of a general plan for carrying on research work throughout the textile industry were discussed. Those present were much pleased with such a plan, and it was arranged that the various delegates should take up with their individual branches of the trade the question of the formation of committees consisting of 12 to 15 men with the purpose of working up the necessary plans and of holding meetings whenever desirable. A general meeting will be held in Washington in the fall. This is the first opportunity of the kind given to the textile industry for carrying on collective research work.

21 Meeting of Interdepartmental Committee on Official Envelopes

As a result of a series of meetings of several members of the Interdepartmental Committee on official envelopes appointed by the Post Office Department, the final form of the specifications and standard samples was discussed and modified. The proposals as now issued include standard samples of paper for color and finish, and grades of paper have been adopted that are similar to the paper used for

the contents of the envelopes. It is believed that the new proposals constitute a distinct forward step.

22 Metals Committee of Federal Specifications Board

The Metals Committee of the Federal Specifications Board has been organized with Dr. G. K. Burgess of the Bureau of Standards as chairman, and Mr. Freeman, also of the Bureau, as technical secretary. Several subcommittees have been appointed, and progress has been made in the formulation of metal specifications. The metals are being taken up in the following order: Ingots, castings, and wrought metal. The subject of chains is also being considered by this committee. The American Society for Testing Materials methods of chemical analysis have been recommended for government check analyses.

23 Fifteenth Annual Conference on Weights and Measures

The Fifteenth Annual Conference on Weights and Measures was held at the Bureau of Standards on May 23 to 26 inclusive. In many respects, it was the most successful conference which has so far taken place.

At the opening session, the absence of Major Louis A. Fischer, formerly chief of the Weights and Measures Division, who died somewhat less than a year ago, was felt by practically all those in attendance, and it, therefore, seemed especially appropriate to devote this session to a few memorial addresses given by men who had been closely associated with him. The first of these was delivered by Dr. Stratton, Director of the Bureau, the second by Dr. C. W. Waggoner, of the State Department of Weights and Measures of West Virginia, and the last by Mr. D. J. Moynihan who spoke on behalf of the manufacturers of weighing and measuring devices. A special committee presented resolutions memorializing Major Fischer.

Following these addresses and resolutions, the regular program of the conference was taken up, and reports were made by the delegates from the various state departments, approximately 200 delegates from 30 states being present.

On the second day, an interesting paper was delivered by William F. Cluett, Chief Deputy Inspector of Weights and Measures of Chicago, on the "Enforcement of Sales by Weight Legislation and the Elimination of the Dry Measure."

The feature of the afternoon session was an address by Hon. Herbert Hoover, Secretary of Commerce, in which he emphasized the need for unity of action through organized conferences and established methods, and the importance, not only of the "prevention of crookedness and the catching of crooks" but also the protection of the honest producer and distributor.

Following Mr. Hoover's address, Mr. John N. Mackall, Chairman of the Maryland State Roads Commission, delivered a paper upon the subject of "Protection of Highways by Means of Portable Weighing Devices." The necessity for

preventing the operation of overloaded trucks was particularly stressed, and Mr. Mackall described an interesting portable weighing machine, operating on the jack principle, by which the load on the rear axle of any truck can be easily determined. If trucks are found to be overloaded, the driver is required to remove any load in excess of the limit prescribed by law and in addition has to appear in court and tell his story. The methods followed in Maryland have greatly reduced the damage to highways by overloaded trucks, and Mr. Mackall recommended that similar methods be employed in other states.

Mr. Charles H. Ferris of the National Bottle Manufacturers' Association pointed out the divergence of the present state requirements affecting the marking and capacity of milk bottles. He particularly urged the necessity of having uniform serial numbers for manufacturers and of a standard mark to indicate the filling point of the bottle.

Mr. George Warner, Chief Inspector of Weights and Measures of the State of Wisconsin, delivered a very interesting paper on the equipment used in that state for the testing of heavy-capacity scales. A special truck, equipped with the necessary test weights, has been provided for this work which has made possible a large saving over horse-drawn equipment previously employed beside giving the additional advantage of greatly increased territory which can be covered.

Mr. F. S. Holbrook of the Bureau of Standards presented the results of a joint investigation of the Bureau and the conference committee on specifications and tolerances for the accuracy of heavy-duty automatic scales.

On May 25, Mr. W. T. White, Director of the Bureau of Weights and Measures of the State of New York, opened the session with a paper on the subject of wholesale deliveries of gasoline with especial reference to vehicle tanks. Mr. White pointed out that tank compartments under proper regulation might satisfactorily be used as measures in determining the amount of gasoline sold to filling station operators and in this the conference concurred.

The principal address for the morning was delivered by Hon. A. H. Vestal, Chairman of the Committee on Coinage, Weights, and Measures of the House of Representatives. Mr. Vestal said that he considered federal regulation very necessary in relation to types of weighing and measuring equipments to be used throughout the country, but that he was equally convinced that it was essential to leave the enforcement of such laws, the testing of scales and measures for accuracy, and the prosecution of offenders to the state and local authorities.

Mr. W. B. McGrady, Chief of the Bureau of Standards of the State of Pennsylvania, discussed the recent law enacted in his state requiring the serialization of all weighing and measuring apparatus sold within the state, and

Mr. Holbrook gave a brief outline of the history of national legislation in reference to the approval of type of apparatus.

The discussion of this paper was continued by the reading of a paper prepared by Mr. P. C. Brooks, President of the Scale and Balance Manufacturers' Association, on "Manufacturers' Attitude Toward Approval of Type."

"Relationship Between Weights and Measures Officials and Manufacturers" formed the subject of a paper by Mr. J. J. Holwell, Commissioner of the Mayor's Bureau of the City of New York. He emphasized the necessity for constant care on the part of the official so that strict justice will be done to all parties, whether manufacturer, merchant, or ultimate consumer.

In the afternoon, the subject of bread was discussed, and the committee on specifications and tolerances proposed the variations from standard weight to be allowed on loaves of bread. Mr. John M. Mote, Ohio State Inspector of Weights and Measures, told of the enforcement of the Ohio Bread Law and gave a very clear outline of the reasons for standardizing loaves of bread by law. This results in only 2 variables to be considered by the purchaser, namely, quality and price, whereas, with 3 variables, quality, price, and quantity, confusion is certain to result.

A recommended field test method for cloth-measuring devices was presented by Mr. Ralph W. Smith of the Bureau of Standards. The proper fabric to be used in making the test of these machines was discussed, and results of an investigation along this line were given.

A resolution was presented and adopted at the session on the morning of May 26 that the regulations affecting milk bottles should be uniform and suggesting that the various states should cooperate with the Bottle Manufacturers' Association in this needed forward step.

The first paper was a very able presentation of the Methods of Manufacture of Precision Weights, and a Resume of the Difficulties Encountered by the Manufacturer of Precision Weights by W. L. Egy and L. W. Higbee of W. and L. E. Gurley.

After this paper, several aspects of the subject of liquid-measuring devices were discussed, and a paper was presented reporting the results of an investigation conducted by the Bureau to determine the evaporation loss from a gasoline delivery hose.

An amendment to Liquid-Measuring Device Specification #10 was presented by the specifications committee and was adopted by the conference, and it was agreed to incorporate into the record a paper upon the "Proposed Procedure for Elapsed-Time Test of Liquid-Measuring Devices," the conference being obliged to pass this paper upon the program owing to the lack of time.

The committee on specifications and tolerances presented the proposed tolerances for fabric-measuring devices, and these were adopted tentatively pending the preparation of complete specifications for these machines at the next annual conference.

Resolutions and thanks were tendered to Hon. Herbert Hoover, Dr. S. W. Stratton, and Hon. A. H. Vestal, for their courtesy in addressing the conference.

A motion to the effect that the entire question of standardization and simplification, as applied to all phases of weights and measures activities, containers, standards, laws, methods of precedure, etc., be given special consideration at the next conference, was passed without a dissenting vote. The executive committee was directed by this motion to give special thought to this subject and arrange for a thorough presentation of the various factors involved so that the matter might be presented to the next conference in its entirety.

It was also voted that the second day of next year's conference should be devoted to the papers by and the activities of the city and county sealers of weights and measures.

The following officers were elected:

President	Dr. S. W. Stratton, Director of the Bureau of Standards
1st Vice President	Mr. A. H. Webster, Commissioner of Weights and Measures of the State of New Hampshire
2nd " "	Mr. W. B. McGrady, Chief, Bureau of Standards, State of Pennsylvania
Secretary	Mr. F. S. Holbrook, Bureau of Standards
Treasurer	Mr. J. Harry Foley, Superintendent of Weights and Measures, State of New Jersey

PUBLICATIONS OF THE BUREAU OF STANDARDS RELEASED DURING MAY.

Scientific Papers

S 430 High-Frequency Resistance of Inductance Coils. Gregory Breit 5¢

S 431 The Field Radiated from Two Horizontal Coils. Gregory Breit 5¢

S 432 An Improved Method for Preparing Raffinose. E. P. Clark 5¢

S 434 Electromotive Force of Cells at Low Temperatures. G. W. Vinal and F. W. Altrup. 5¢

Technologic Papers

T 209 Thermal Stresses in Chilled Iron Car Wheels. G. K. Burgess and R. W. Woodward 5¢

Circulars

C 120 Construction and Operation of a Simple Homemade Radio Receiving Set. 5¢

Miscellaneous Publications

M 49 Graphic Comparison of Screw Thread Pitches. 5¢

These publications may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the prices given above.

Respectfully,

S. W. STRATTON

Director
HGB